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Drunk With Power and Success, Fanatical War Lords Dream of Enlisting Such Allies as Deadly Germs and Viruses, to Be Unleashed From Test Tubes Filled in Laboratories Whose Science Is Dedicated to Destruction.

Insect Pests May Be Sent in Hordes Against an Enemy, Leaving In Their Wake Barren Fields Like This—Which Means Starvation.

The "Minute-Men" of Science Are Working Day and Night Concocting Protection and Antidotes Against the Deadliness of Modern "All-Out" Horror Weapons.

Migrating Birds Artificially Infected With Psitticosis, Horse Encephalitis or Other Germs to Spread Disease in Other Lands, Are on the Destroyers' Program. But the Homely Potato Bug (Above) May Strike Back at Germany, as a Destroyer of Food.

THE author of today's startling article on these pages must remain nameless. A doctor who until recently was employed as a consultant on the pharmacology of chemical warfare in the closely-guarded laboratories of two European powers, he knows at first hand what feverish activity is going on as scientists compete to turn out fresh horrors for the day when the real "all out" comes.

He is now a refugee in America and for reasons of personal safety his identity must be concealed by a pseudonym.

By DR. MILLEN HUGHES

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SWARMS of English and German spies have been reporting constantly to their respective headquarters on the scientific horrors devised in each other's laboratories for use in this "all out" war of total destruction in which half the world is now engaged. On the strength of these reports, scientists have worked night and day to perfect counter-terrors and neutralizing agents to render the original ones ineffective.

Above all, these armies of spies have been striving desperately to find the one weak link in the other's armory of horror, while their laboratories strain to produce the ultimate barbarism to which there is no reply but despair. But until one or the other can be found, or until one side becomes utterly desperate, these fantastic chemical, bacteriological, and even insect and animal weapons are being held in reserve.

All of Adolf Hitler's important ones are known. The only mysteries about them are how far the various kinds have been developed, and which he may perhaps eventually risk using, and where. For most of them are likely to prove two-edged swords, and some, which he might not dare try on England, might seem safer to unloose on the American continent.

Hitler has boasted that he has a secret weapon against which there is no answer. But this is not true. For, unless the weapon can produce an almost instantaneous knockout, there is always the answer of retaliation with the same or a slightly different form of the same thing.

The Nazis are not likely to drop mustard gas, still the most effective known to science, or any of the other world-war poisons on London because they know that in a few hours tons of the same stuff will be raining down on German cities. On the other hand, if the Germans should pour down from the English skies chemical compounds of thallium, which is one of the earth's 92 elements, there is little danger that the Royal Air Force would dump any of that particular poison on Berlin because Germany controls almost the entire world supply. But the retaliation would be with something else, possibly the synthetic tri-orthocresyl phosphate—that is, if England and the U. S. A. are not still thinking in terms of the past or what is almost as bad, the present, instead of the future.

Thallium compounds are suggestive of the time bombs which do not explode until some time after landing. Their action is perhaps even more like a germ disease in that the poison has to incubate from one to three weeks before the victim knows that anything has happened to him. The synthetized phosphate has a similar period of about 21 days before symptoms appear. This poison was unknown, except to scientists, until called to public attention during the Prohibition era, when thousands died from drinking Jamaica ginger. The effects of these and other sky-poisons I will describe later, including one which can be generated dramatically in the sky itself.

THE scientific Pandora's box contains devils of the air ready to attack not only human beings but animals, food-plants, cotton, flax and any other form of living thing useful to man, but even that is not all. Still others, which would do negligible harm to animal or vegetable life, might be effective in poisoning the explosions of the airplane's gasoline engine. One of these is already right there in the engine. In small doses, it acts as a sedative on the motor, but, as with most drugs in the human system, a large enough dose kills the engine.

This is our old, familiar acquaintance, tetraethyl lead, whose presence the law requires the filling station operator to advertise on his pump. There is just enough of this explosion-poisoner in each drop to even the explosions, preventing knocks and "pinging" to which high-compression engines are subject, but a large amount would stop the engine dead. Iron carbonyl and many others have the same effect.

Diesel engines are immune to tetraethyl. Therefore if the Germans should send a fleet of Diesel bombers over London and poison the air with tetraethyl, British planes could not fight them, and it would be worse than no answer to shoot up more in shells from the ground. But if the British would poison the air with the war-gas chloropicrin, this would be the almost perfect retort because, though that gas does not even annoy a gasoline engine, it poisons the explosions of a Diesel engine.

Prince Rupprecht, of Bavaria, said of France: "We are adequately prepared for the last war." Winston Churchill sarcastically remarked that the British army had been mechanized to the extent that its horses had been taken away from it. France and England both seem to have entered the present war adequately prepared for the last world war. The question is whether England and America are now preparing for war as it was waged in 1940, or as it will be waged in 1941. The general public, however, seems to be worrying about weapons that exist only in their imagination, such as the "death-ray."

THE Belgian fortress of Eben Emaul blocked the path of the German blitzkrieg, its garrison standing alert at the guns ready to annihilate the advance guard of invaders with their light tanks and infantry.

According to a German communique, a single airplane landed in the courtyard of Eben Emaul and somehow rendered the entire garrison so helpless that the infantry rushed up to the mysteriously-stilled turrets and captured this key position, without a shot being fired at them.

The story gave birth to rumors that it was Hitler's "unanswerable weapon," and must be the death-ray because what else could paralyze a whole garrison like that? It was not a death-ray for the reason that, though there are rays which will kill a rabbit at a distance of a few feet, these require tremendous amounts of power, more than any plant could generate, and no amount of power would make it strong enough to strike down the entire garrison of a fortress.

Assuming that the communique is to be believed, which is assuming a lot, such a result is at least conceivable as a result of using one of the so-called "nerve-gases." One of the commonest of these is trichlorethylene, which can be manufactured in unlimited quantities from coal, salt water and air. Those who inhale it are made unconscious for a short time. But even if one of this type had been concentrated greatly, it still would be useful only in enclosed places, and of small influence on the war, as has been the much-exploited magnetic mine. More likely the garrison was paralyzed by the "nerve-poison" of Fifth Column propaganda such as caused men stationed to blow up bridges to desert their posts long before there was any sign of the enemy.

WHY hasn't Herr Hitler used any of the new poisons such as thallium, the disease microbes such as those of the Black Death, or the killers in the form of fungi, germs and insects to destroy animal and vegetable life, which he is known to have in his chemical arsenals? The main reason is the lesson the Germans learned from introducing poison gas in the last war. The new weapon must score a quick and decisive victory before Germany can be also knocked out by retaliation. Der Fuehrer can bide his time, safe in the knowledge that no matter what England may have, it will never be used on Germany first for humanitarian reasons. As Hitler himself has put it, "England and France are de-brutalized."

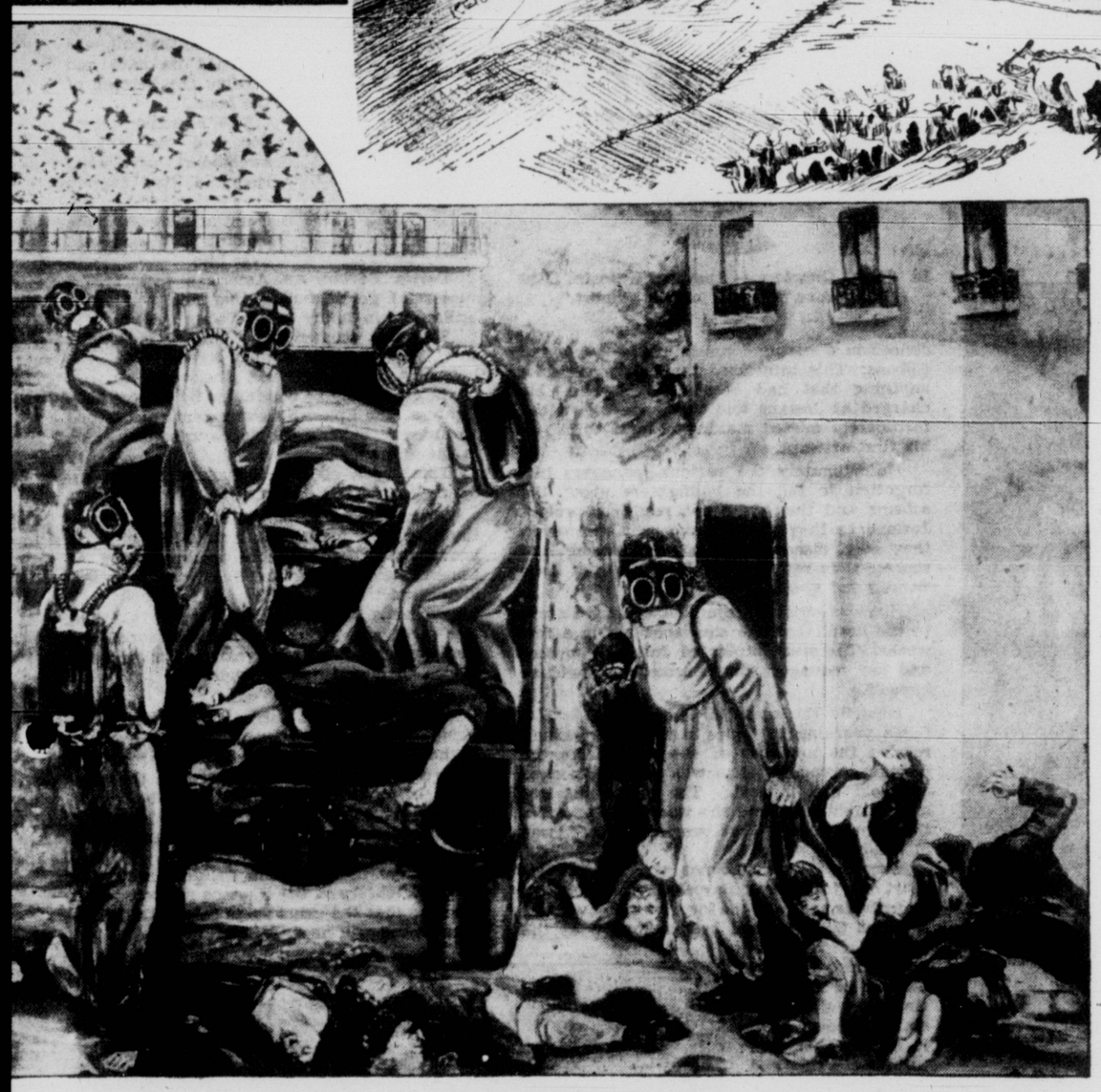
Take thallium, for instance; as odorless, tasteless crystals, it could drift down from the heavens. The element's atomic weight is 204, lying between gold and mercury. Thallium, itself, is a metal and not suitable as such for poison-gas warfare. The important point is that thallium has been turned into vaporizing organic compounds which slowly evaporate into the air as do mothballs and camphor. It is the organic form which is so deadly. It is a poison, cumulative in its action and affects the human body as does arsenic and mercury. Less than one gram will kill a human being weighing 200 pounds. A pound of it would kill 500 men should it reach them, and a ton would kill or cripple a million people. There is no known antidote, at least outside of Germany.

The slow action of thallium is both an advantage and a disadvantage. Since it will take at least a week before the first symptoms appear in its first victim, this might allow the Germans seven days and seven nights or more of intensive air-

's Newest Terrors d at "War of Total truction"

shed by the Are Hellish , Mists of -Destroying of Infected Work to Dis- ese Barbar- unter Agent

Like the Dread Four Horsemen of the Apocalypse, the Soldiers of Horror Await the Call to Ride, and From the Storm Clouds, Scatter Their Deathly Burdens Over Every Peaceful Village, Farm and City — Unless They Are Checked by Weapons More Terrible Even Than Their Own.



Most Hellish of All the Chemical Weapons Is Reported to Be a Gas That Is Odorless, Invisible — and Which Leaves Its Victims in Good Health for From One to Three Weeks — Then They Fall Dead.

poisoning before the British started to get their retribution started. But not if Britain has learned anything about this enemy, more ruthless than any native savage. Surely England has her chemists constantly testing the air of all sizable towns for evidence of chemical as well as bacteriological warfare. If so, they would detect the first sprinkling of thallium and retribution would be on its way, perhaps within a few hours.

Knowledge of this would deter the Nazis who put their faith in terrorism because they themselves are easily terrorized, as proved by frequent panics among crews of their warships, such as when the pocket battleship Graf Spee was attacked by three little "tin-clad" British cruisers. The German army of invasion might find an army of defense too sick and decimated to offer much resistance, but this would be of little avail to a sick and dying army of invasion.

What is the justification for believing that Germany is loaded up with this and other new poison gases? Before the present war, every time warnings of such things were printed, certain American chemists arose with surprising alacrity to deny them, as "fantastic impossibilities." These same voices will probably be raised again, and therefore I will devote a paragraph or two to the evidence. Here are the facts:

The total production of thallium in 1924 was some 500 pounds. In 1933, relatively large scale production as a byproduct of zinc refining was undertaken by the Vielle Montagne Zinc Company of Belgium. But the maximum total production of the poison from this source, if the output from the entire world's zinc were considered, would have been only some 10,000 tons.

All very nice had the war been fought in 1933, but just then began one of those behind-the-scene shifts which are typical of German war-preparations. The world demand for arsenic ores before 1933 was about 15,000 tons, of which the peace-loving United States consumed two-thirds. Since 1935 Germany has contracted for 50,000 tons a year from Sweden alone, which puzzled military and scientific circles of all countries.

The usual guess has been that the arsenic was intended for production of the known war gases, the most effective of which contains arsenic as the base: mustard gas, Lewisite, Adamsite, Clarksite—all arsenic poisons. This in itself was such a terrible threat that few looked for anything worse. For example, 50,000 tons of arsenic could produce 130,000 tons of Adamsite, and 40,000 tons of this gas could destroy all living things within the London area. But when one realizes the composition of this Swedish ore, the real threat appears.

Swedish arsenic ores contain from 0.5% to 18% of thallium. The importance of this fact is magnified by the further fact that Germany also controls the only other sources of thallium which are in the Hartz Mountains and Macedonia. Let any optimist try to invent any good reason for Germany's cornering the arsenic and thallium markets.

Contrary to the practice of the last war, there is no doubt that this gas, if used, will be sprinkled forth over the widest possible areas of dense population, possibly disguised by the dropping simultaneously of a certain number of explosive and incendiary bombs. The result will be that later millions of people will suddenly come down with an illness, ranging in severity from acute stomach and intestinal upset to complete paralysis and death. Those who have been heavily exposed will die, others will be disabled for many weeks, if not permanently. Those who have been lucky enough to escape entirely will be needed to nurse the stricken.

FLAME throwers have been used since the days of the ancient Greeks, and their secret, probably some sort of petroleum product, was known as "Greek fire." All modern armies have experimented with the idea of squirting inflammable liquids, reaching a distance of several hundred yards, but that was not enough. Now comes a gas that can be distributed for miles by low-flying planes or allowed to drift with the wind from cylinders in the trenches or from invading boats, toward the shore, when the wind is right, before taking fire.

This gas has all the advantages which the old flame-throwers lacked, such as covering great distances, setting the very sky on fire, killing many by its heat and by destroying gas masks and clothing, leaving the survivors an easy prey for ordinary poison-gas waves sent after it. If, in addition to all these things, the burning gas, by its own combustion would produce its own poison gas, then it would indeed be the perfect thing, almost too bad to be true.

And one gas, dimethyl beryllium, fills each and every one of those requirements. Dimethyl beryllium exists as a gas that spontaneously ignites on contact with moisture, burning with a terrific heat and creating beryllium oxide fumes which are such a deadly poison that one of the great problems in the manufacture of beryllium metals has been the toxicity of the fumes released in the process of refining.

Unlike thallium, nature has distributed this poison liberally all over the world, but it is found only in combination with other substances from which it has been hard to extract. Only recently have means been found to do this on a practical scale, and it is still costly. The metal also has useful peacetime properties as an alloy. It hardens babbitt metal, makes motor bearings "fatigue-proof," and is said to give copper a hardness greater than steel. These innocent features made it possible for Germany, France, England and the United States to carry on a struggle for control of the metal, without a word being said of its military importance. There seems to be no reason why England and America should not have ample supplies of beryllium.

Besides being floated in large clouds over cities and troop concentrations, it may be dissolved in other inflammable substances, such as gasoline, for these too act as a primer in igniting them. It can be enclosed in bombs and shells for action against distant objectives. It is true that use of this gas demands much care and equipment, including specially devised apparatus for keeping the substance dry, anti-catalysts to retard over-quick combustion, and troops trained in its special technique and held in reserve until needed. But the Germans shine at organizing such details as these. They have decided to become Yankees at the point where Yankees leave off—converting new discoveries and inventions into engines of death.

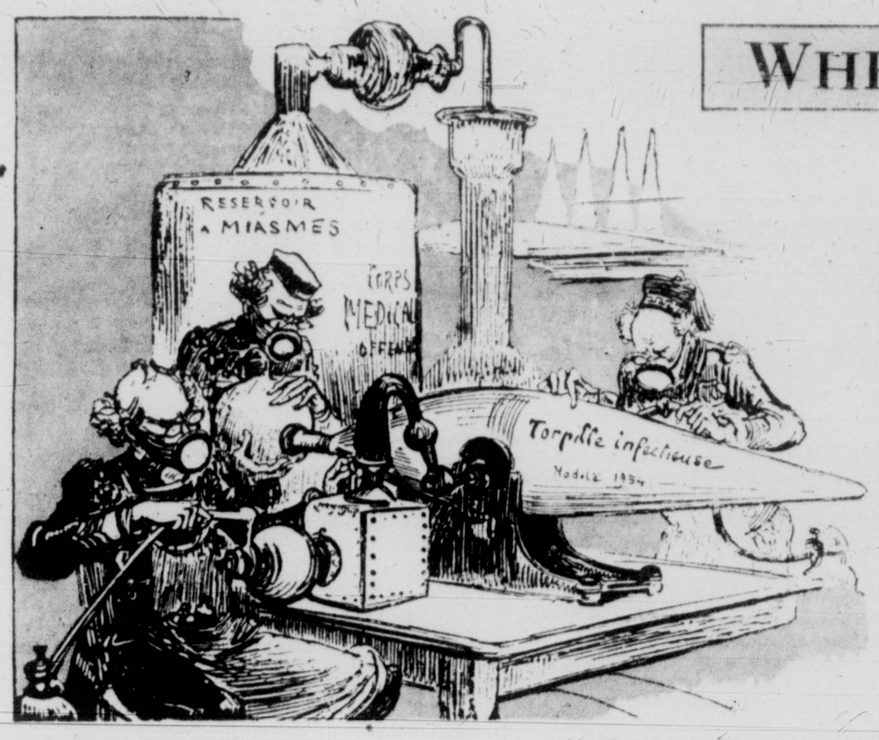
This may be the ideal gas to waft ashore in advance of the invasion of Britain. If so, neither this nor any other kind will be used before that time because, at the first whiff the British will rebrutalize themselves to the extent of retaliating in kind, against the invasion ports and perhaps the German cities.

The German General Staff now realizes the truth of the precepts laid down for them by Fritz Haber during the last war, when he first introduced gas warfare. Haber insisted that if gases be used at all, they be done in an "all-out" opera-

(Continued on Page 13)

Was It "Nerve-Gas," a Weapon That Caused Mass Fear and Hysteria—Or Was It Really Fifth Column Propaganda That Caused the Belgians at Eben Emaul to Give Up Without a Struggle?

WHEN THE REAL "ALL OUT" COMES



A French Illustration of 1882 Forecasting a Horror That May Add to the Barbarities of the Present War. In This Drawing, Scientists Are Depicted Filling a Bomb With Deadly Germs to Make Troops Incapable of Resistance. Photo from Bettmann Archive.

(Continued from Double Page)

tion, over the widest possible front and only if a quick victory seemed possible.

CHEMICAL death is not the only, nor perhaps the worst that can be sent down from the clouds—there is also living death-dust. Heinz Leipmann, in his "Death From the Skies," states that some years ago, at one of the main entrances to the London subway, an alien stranger was picked up by the police for releasing bacteria. Further immediate investigation tracked down in the depths of the subway another alien, carrying in his hand a culture plate.

By exposing various plates, at different sections of the subway, he was able to determine the spread of the bacteria released by his colleague. Both men, by their own statements, were Berlin health officials, making the tests "in the interests of science." The bacteria were harmless, and in spite of the fact that they had no sanction for such experiments, the de-brutalized democratic court of Britain released them.

In the interest of what kind of science? In "The Berlin Diaries," by Dr. Helmut Klotz, officer of the Reichswehr General Staff, is as clear a warning as the world could ask. He tells of being introduced by Herr Duisberg, managing director of the German Chemical Trust, to a young chemist who lectured on the prospects of a bacteriological war. He assured them that there was plenty of material available and the effects were prompt and absolutely sure.

Add to these revelations, Herr Hitler's confidential discussions with Hermann Rauschning, former lieutenant and Fuehrer of the Danzig Free State, in which he outlined the Nazi plan for using bacteria against England and the United States, if necessary. Rauschning, in his book, "The Revolution of Nihilism," tells of the interview in an almost casual manner.

From the Nazi point of view, destroying a nation by producing an epidemic such as the Black Plague offers the same problems as a gas attack, and also some extra ones. The attack must be decisive and reasonably quick. Outbreaks in several cities and army camps would not be enough because modern medical science would deal with anything like that. The epidemic must start at almost its peak and at almost all parts of the nation at once.

This would require greater quantities of the microbe or virus than perhaps nature had ever produced at one time, and would have been as impossible ten years ago as for Germany to have produced an army of a billion men. But since then the picture has been entirely changed by many discoveries of which I will only mention three that have come within the last few years.

The first of these was the discovery that microbes and viruses can be grown in almost limitless quantities in chick embryos. The next was the ultra-speed centrifuge, making it possible to concentrate the virus substances in pure form. Last, but quite as important, was lyophiling (quick dry-freezing) which made it possible to store germs and viruses indefinitely, like ordinary munitions. They now had quantity production and accumulation. All that remained was delivery of the dreadful goods.

Of course the planes could scatter enough of any one microbe or virus to infect every man, woman and child in England. But fortunately the problem is not so simple as that. Each virus or bacterium has its own habits which must be respected or the results will be negligible. However, microbian prejudices are by no means as strict as had been thought. For instance, most everyone knows that the true and original "sleeping sickness" is spread only by the tsetse fly, and that those who live outside areas infested by that fly need have no fear of the disease. But it has been discovered that sheep will carry the disease. Sheep have been one of the notorious carriers of anthrax, but experiments have recently shown that stable flies are also acceptable to anthrax.

Infected mosquitoes carry malaria and millions of these could easily be released over England, but malaria is too slow. What faster-acting diseases can they also carry? Ask the German bacteriologist—he knows.

GERMANY, in looting Holland and Denmark, carted away food, converted the people's real money into German marks, and also took away their treasure of precious flower seeds. These were shipped through Russia to the Pacific and by Japanese ship to the United States where the other day, several million dollars' worth arrived. The exchange will be used for Fifth Column work against the United States and the seeds will be planted from coast to coast. But what else may the customers get for their money? Hitler's bacteriologists may be saying it with flowers, in a microbe war.

Lyophiled bacteria and viruses, mixed with carborundum powder may be dropped as smoke over the cities of England and the

(Continued on Page 15)

Child Derelicts of Paris

(Continued from Page 5)

cais, and German equally well.

The story generally believed, is that Madelaine was in a convent somewhere in Northern France when a squad of Nazis pounded at the front door. The children, in panic, dashed out other doors and in spite of the efforts of the sisters, kept on going in the hope of getting to their homes on foot. Some say that the convent was bombed but records of those that were attacked show no indication of having harbored anyone who fits Madelaine's description.

Anyhow, Madelaine managed to reach her home in Paris only to find it deserted by all except her old nurse. Presumably her father was killed or captured at the front and her mother killed in flight. More than likely her own family car was among those stripped by her gang.

THERE is a long, unfilled gap between her arrival at home and her appearance in front of the dilapidated old cafe. The truth of what happened during that interval will never be known until after the war because anyone who tries to find out soon meets a Gestapo agent who informs him unpleasantly that the matter is unimportant and he had better find some more useful occupation.

It is too much to believe that any 16-year-old child, accidentally passing the cafe when the starving children came out, took charge and, on the spur of the moment invented the plan which worked so successfully. Some of her elders though hardly betters, must have coached and planted Madelaine there, with the dull-witted, though faithful, nurse.

Who these persons were, is as much a mystery as the source of her endless supply of clean white gloves. She and her gang seem to be just another cog in Hitler's new plan for Europe. The Germans do not recognize her organization, of course, and have threatened to place all the waifs in a concentration camp, as they easily could, but no such move has been made.

Madelaine, said to be utterly unscrupulous, is so wily that her followers believe she can read their minds and therefore never lie to her. It cannot be denied that the flapper dictator has done much good. Nothing will convince any of the gang that she did not save them all from starvation.

This may be quite true and certainly she has seen to it that the members are among the best-nourished children in occupied France. Though the children sell vitamin concentrates, manufactured in the United States, they neither consume any themselves nor need them. None probably knows anything about balanced meals but their appetites tell them when they have had too much of one thing and their systems need another article of food. Other children know what they need too but their mothers do not know any way of getting things that are not in the markets, only Madelaine the mysterious, can do that.

The workers of the gang range in ages from 8 to 18. The older ones are welcomed by some of the cafe proprietors for whom they act as runners, drumming up nocturnal customers. There are also quite a few too young to be of any service and one or two babies, which are supported as a form of charity. The organization cares for its sick and injured, calling in and even paying for a doctor when needed. He is the only adult permitted within headquarters, except Madelaine's nurse.

An unexpected feature of her rule is that White Glove Madelaine makes as many of her gang attend school as she can manage. When one is arrested, he or she spends most of the 24-hour-imprisonment studying school books. If the young prisoner has no books, another member soon appears with them.

AGAINST this good, is a heavy balance of evil. Of course morals were tossed out the window, along with other "technicalities" of a smashed world. Madelaine is said to have always at least six lovers among the older boys, which might have been prophesied by anthropologists. Just as the Germans have reverted to the same savage socialism in which Julius Caesar found them, so Madelaine and her gang have gone even further back to the stage of matriarchy, in which polyandry belonged.

Another evil that could have been foreseen is that many of the children have become addicts of the narcotics they peddle. Madelaine eats and also drinks moderately in the local cafes, where she not only pays cash but tips liberally. In return she receives tips—on whom to rob. She trusts no one but a few stranded Americans, although this may be on account of the value of the few dollars they still have in their possession.

She never touches drugs. Why she allowed others to start on the deadly road is not known, but possibly it is because she thought warnings on that score were more technicalities to be disregarded.

Gas, water and electricity have been turned off at the urchins' headquarters, where little cooking is done. Some of the members cook their meals, like tramps of old, in tin cans over fires in alleys. But for the most part they know how to get it done expertly for them. Usually all they need do is knock at the kitchen door of a mother, known to be a good cook, show her what raw food they have and get her to prepare it on a small commission basis. A Parisian mother will do almost anything to give her child a good square meal—and no embarrassing questions asked.

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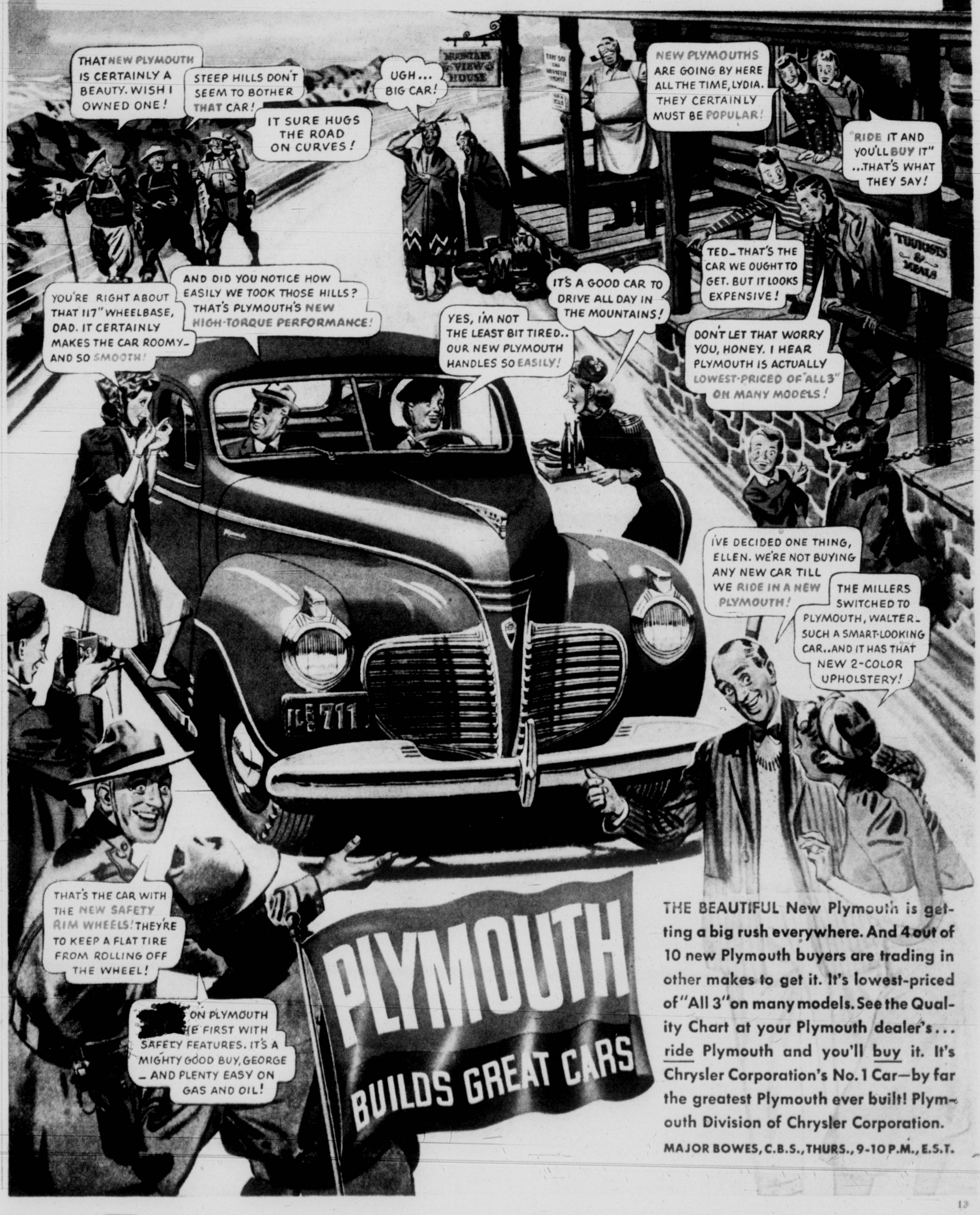
IN SALES—AND ON THE ROAD— SOME CLIMBER!



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MAJOR BOWES, C.B.S., THURS., 9-10 P.M., E.S.T.

"MEN ON HORSEBACK" WAIT TO UNLEASH NEW WAR HORRORS

(Continued from Page 13)

United States. They can be dispersed as mists in an oil medium over wide stretches of territory. They can be used to coat the inside of bombs dropped from planes and of shells fired across the Channel. They may accompany mustard gas or Adamsite. They may be encased in slow-dissolving membranes and dropped into water reservoirs. Loosed seven miles up in the sky and as an impalpable dust they may ride the winds of the stratosphere for thousands of miles.

Last Fall when the storks of Holland made their usual migration to South Africa, some arrived with messages attached to their legs telling of the miseries of German occupation. These same birds will return next Spring, which is not important, but so will many other kinds of migrating birds to England and the United States. Just before the time for their migration Nazi agents could infect them with psittacosis, equine encephalitis and perhaps other germs which they have never carried before.

The special problems of disease warfare are many. Besides depending on such variables as wind, seasons, insect and bird carriers, the diseases may backfire on those who dispense them. Poison gas may also do this. Munition dumps and oil tanks explode but such disasters are strictly local. Explosives and chemical poisons are not self-propagating but the virus and the microbe are and all human beings are meat to them. If the wind should shift unexpectedly, the disease-dust meant for England might roll back to settle all over Europe, including Germany.

So before the Nazis start dusting England with death, they must produce and distribute enough serum or other sure-fire cure to save their own army and civilians. Since most of Europe is working in one way or another for the German war machine, it might be necessary to also save the lives in most of the occupied countries. Even worse, the infected air might roll back as far as silent partner Stalin's Soviet Russia.

For these reasons anything distributed wholesale in England would have to be mixed with carborundum powder, oil spray or some other vehicle to prevent the microbe or virus from wandering too far. This objection however would not apply to the United States and Canada. Planes could be sent from Mexico and from Japanese freighters on the Pacific to infect the West, the South and perhaps much of the East.

By choosing the right sort of night weather, the planes might not be identified as aliens. Since they would appear to drop nothing, nor to take photographs, even if the death-dealers were spotted, probably nothing would come of the incident but diplomatic grumbles followed by denials of responsibility, until too late.

Canada, consisting of only about 11,000,000 people scattered over such a vast area, would perhaps cost too much per capita to be worth destroying in that way. But for that very reason, she is more vulnerable than densely-populated countries to another form of air attack.

EVER since France gave up, it has been the task of the British navy, single-handed, to blockade all Europe, except for the enormous leak through Russia, keep the German navy hiding in its harbors and to convoy the ships bearing munitions and food to England.

England grows only 30% of the food she needs, the most important item being wheat. Here are a few figures indicating what an air war on wheat alone might accomplish. Hitler controls about 60% of the world's wheat, if Russia be included. The remaining 40% is raised in the following proportions: Canada — 6%; Argentina 4%; India—10% and the United States—20%. The total exports of these areas comes to approximately 400,000,000 bushels.

Since the normal imports of the British Isles are about 250,000,000 bushels, Britain's wheat supply would appear safe provided she continues to get it by the German submarine and bomber blockade. But wheat is an undependable crop, liable to severe injury by rain too early or too late, drought or abnormally long or hard winters.

Many species of insect pests take advantage of changes in the weather. Rusts spring up overnight, smuts beset the filling grains. Viruses alone or in various combinations with each other and with insects, conspire against full crops. So notoriously varied are the results of wheat-farming that a whole system of dealing and gambling in wheat futures has arisen. A loss of 10% in the wheat crop outside Hitler's immediate control would be 180,000,000 bushels and anything beyond that would seriously affect England's ability to feed her people.

Consider what could be accomplished if the Axis should take in as partner just one insect, the Hessian fly. This creature, about one-quarter the size of the ordinary house fly, is found wherever wheat is grown. It spends the Winter sticking to the stubble of wheatfields, encased in a tough, brown, outer shell, resembling flaxseed and which protects the dormant larva against the coldest winters.

There are two periods when the fly emerges from the "flaxseed" stage, one in the Spring and one in the Fall, both controlled by temperature and moisture. The flies emerge by thousands, mating and each female laying an average of 250 eggs. Two or three days after the eggs have been laid they hatch into maggots which suck the sap of the wheat and quickly destroy it. Having done this they go into the "flaxseed" stage, thus completing their life cycle.

Once wheatfields are infested there is no known means of wiping them out, but man has learned to reduce their destructiveness by delaying the sowing of the wheat so that it does not come up until after the flies have emerged and laid their eggs elsewhere than on the wheat.

It requires very little imagination to vision what can be achieved with this pest. Thousands of pounds of the "flaxseeds" can be gathered under controlled conditions. (Hothouse breeding of the flies is carried out even now for experimental purposes.) These can be retarded by the proper conditions of moisture and then sown from the sky over the wheatfields of India, Canada, Argentina and the United States.

Like every other weapon, this has its drawbacks, for instance the fact that Italy's Winter wheat crop sown in the Fall and entirely in the South, is wide-open to a dose of this same medicine which would result in no spaghetti even for what is left of the Italian army. However, Italy has become more of a liability than an asset to the Axis and Hitler might not care much if it should surrender. In this case de-brutalized America would doubtless divert some of the wheat needed in England to save the victims of Mussolini's folly.

ENGLAND raises about 60% of the beef it consumes and a considerable amount of its mutton. To destroy these animals nature has provided the hoof-and-mouth disease which attacks cows, horses and sheep. This is so virulent that it infected a herd of cattle that passed over a road on which infected animals trod 48 hours previously. Perhaps the Nazis never thought of using this disease as a weapon.

But just in case they ever should, it seems that they are abundantly prepared in advance. It is known that the Germans have devoted the Isle of Biems to a State Research Laboratory, to "study" hoof-and-mouth disease. Professors Koebe and Waldmann have been culturing the virus, storing quantities "for future reference," attempting to increase its virulence by selective processes and finally making vaccines.

For every useful animal and plant there are deadly enemies which have been held in check only by the best efforts of science. If science suddenly changes sides, one can easily imagine how any of these may be stepped up in their destructive efficiency.

In Quebec, during 1930, the spruce sawfly was found after devastating 2,000 square miles of the finest Canadian spruce. Within the next nine years, despite the concentrated efforts of the government, the fly managed to destroy 12,000 more square miles. It would be possible to make the forests of the Americas little more than dead stumps. But is there real reason for believing that Germany has seriously contemplated any such fiendish alliance with the natural enemies of humanity? I think so.

There has been abundant evidence even as far back as 1926 when Leland O. Howard, former Chief United States Entomologist, visited Germany. In Rastatt, Baden, he found a complete laboratory devoted to the study of the corn borer. The American expressed astonishment that impoverished Germay should spend such a large sum to study a pest which attacks no crop grown within the Reich. Dr. W. Zwolfer, expert in charge, explained with a perfectly straight face that Germany was thinking of trying to raise some in its southernmost areas. Dr. Howard relates this experience in his informative book, "The Insect Menace."

The reader may well ask why, if Hitler holds all these weapons of destruction in his hands, he has not already unleashed at least the slow-acting ones, such as the food destroyers? Can it be shame at what future generations will say of him? Hardly. This question was asked in the last war and received the following sardonic answer:

"As winners, we will write the history."

This means that Hitler's historians would blame all gas, microbe, insect attacks and other blows below the belt on England which forced Germany to strike back. But there are other reasons, more appealing to a dictator. Germany's men and animals subsist largely on the potato crop which can be devastated from the air by various enemies, one of the most efficient of which is probably a native American insect, the Colorado potato beetle. The fear of such retaliation as that and nothing else will continue to make Hitler hold his hand.

Wonderlands Under the Sea

(Continued from Front Page)

currents of the North was visible in only about half that depth.

The purest oceanic blues are to be found in the warm regions of the Pacific and the Indian oceans and the Sargasso Sea of the Atlantic. Although blue is the most commonly characteristic color of the sea, in point of fact in certain localities and under certain conditions of weather or from biological causes, all colors of the spectrum may prevail. Indeed, a not infrequent color occurrence along the Atlantic coastal waters of the United States is a hue of intense red. This aspect is given to the water by countless millions of microscopic one-celled creatures, called dinoflagellates, which periodically swarm these seas.

So it is also that the optical property of sea water is of considerable importance, as this property affects the penetration of sunlight and its consequent influence upon the growth of vegetation. For every plant needs light to reduce the carbonic acid essential to its growth and, in truth, its very existence. Some may require more, others may want less, but without it no vegetation can live.

Obviously the actual depth to which light can penetrate varies in different localities, but generally speaking it may be said that at depths of 600 feet no light can be received from the sun. Even at depths considerably less the amount of light that penetrates is so feeble that it has little or no influence upon life.

Our knowledge of the color of the sea is limited, as is our knowledge generally of all that pertains to this vast area which is greater than that of the exposed land. But facts are accumulating. Oceanography, or the science of the sea, is a comparatively recent development. When scientific investigation of the sea began we were obliged to get most of our information from conditions prevailing near the shore or from mariners whose reports of conditions far from land were usually colored with marvelous or frightful accounts. But with the later rapid increase in the study of the exact sciences came the development and invention of accurate instruments, and with the aid of these, observations are now becoming easier and more common. Even the ship's logs of today have special headings under which are listed the various phenomena as these occur on the surface. However, the greatest advances in oceanography are occasioned by the researches of expeditions made in vessels especially equipped for the purpose of marine exploration and investigation.

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How to become Some Man's Dream Girl

Lesson #1 - *Launching your Campaign*

You've just met him—in fact, you're barely past the "how d'you do" stage. But a hopeful flip of your heart indicates that *here* is a situation with Possibilities. How are you going to make *him* feel the same way about things? How are you going to catch his wandering eye and *hold* it? Here are some pointers that'll help you fool-proof your opening campaign:—

DON'T at the first encounter, wheel out your heaviest artillery and aim all your big ammunition straight at him. Men scare so easily!

DO line up a couple of other conquests for decoy. He'll follow the crowd. P.S. In any Battle of the Sexes, your best ammunition is a complexion of disarming sweetness. So concentrate on Pond's beauty maneuvers. Nightly! And before make-up!

1

DON'T let any other man drag you into a shady corner and tell you the story of his life. If your hero sees you at all, he'll be too polite to break in on such a cozy tête-à-tête.

DO stay in the folksy, 100-watt foreground—if your skin can take the glare! Clinch *that* with a brisk daily 3-minute patting-in of luscious Pond's Cold Cream. Wipe off cream-softened dirt and old make-up with gentle Pond's Tissues. Repeat! See how this double cleansing and softening with Pond's makes pores seem smaller—little "dry" lines show less!

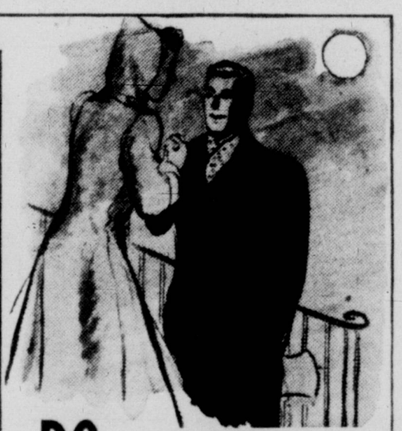
2

DON'T take the initiative on the cheek-to-cheek stuff when he asks you to dance. If he's a conservative, he may think you a forward miss. If he *isn't*, you'll soon find out!

DO have a skin that looks so caressable he can't resist it! Then melt his heart with the sweet, satiny *feel* of your face! Pond's Cold Cream, followed by a splashing of Pond's Skin Freshener, lends baby-skin tenderness—and Pond's Vanishing Cream whips off little roughnesses like—*that!*

3

DON'T try to dazzle him with your wit and beauty when he's already blinded by the shine on your nose. There's nothing—no *nothing!*—so sad and ridiculous as a shiny-nosed girl trying to be a charmer.



DO look flower-fresh and dream-girly right through to the all-important good night. Dead or departed make-up won't haunt you a second if you put your powder over a glamorizing foundation of Pond's Vanishing Cream.

4

DON'T sit back and dream wistful dreams of being some big strong man's little dream girl.

DO send for Pond's beauty kit! Such so-smart beauties as striking Mrs. John Jacob Astor, sparkling Liz Whitney, winsome Margaret Biddle are Pond's devotees. Don't dally! Another She may be luring him on this very minute!

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I want to launch my dream-girl campaign *right!* Please send me—pronto!—Pond's Special Beauty Ritual Kit containing Pond's Cold Cream, Pond's Tissues, Pond's Skin Freshener and Pond's Vanishing Cream. I enclose 10¢ for postage and packing.

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